CLAIMS

1. A method of fabricating a cathode, comprising:

depositing a carbon material on a portion of a titanium substrate;

heating the deposited material and the titanium substrate at between about 600 degrees to about 1,000 degrees Celsius at a reduced pressure and/or under a chemically inert cover gas to form a titanium carbide layer at interface of the titanium and the carbon material; and

activating the deposited carbon material by heating in an oxygen-containing atmosphere for between about 0.1 hour to about four hours at temperatures between 200 degrees and 500 degrees Celsius.

2. A method according to claim 1, further comprising the step of post-processing the titanium carbide layer.

3. A method according to claim 1, wherein the depositing step is performed by at least one of: a manual painting process, an ink jet printing process, a thermal transfer printing process, a hot stamping process, a dye sublimation process, a screen printing process, a chemical vapor deposition process, a sputtering process.

4. A method according to claim 3, wherein the ink jet printing process comprises a thermal ink jet printing process.

5. A method according to claim 3, wherein the ink jet printing process comprises a piezoelectric ink jet printing process.

6. A method according to claim 3, wherein the chemical vapor deposition process comprises a plasma-enhanced chemical vapor deposition process.

7. A method according to claim 1, wherein the carbon material comprises a carbon nanotube material.

8. A method according to claim 7, wherein the carbon nanotube material comprises a single-walled nanotube material.

9. A method according to claim 1, wherein the titanium substrate comprises an interior portion of a capacitor housing.

10. A method according to claim 1, wherein the titanium substrate comprises a thin sheet of titanium.

11. A method according to claim 10, further comprising:
depositing the carbon material on opposing major surfaces of the thin sheet of titanium.

12. A method according to claim 10, further comprising:
cutting the thin sheet of titanium into smaller units.

13. A method according to claim 1, further comprising:
covering the cathode with a dielectric separator material.

14. A method according to claim 13, wherein the dielectric separator material comprises at least two discrete layers of dielectric separator material.

15. A method according to claim 13, wherein the dielectric separator material comprises one of a polyurethane material or a polypropylene material.

16. A method according to claim 1, wherein the cover gas comprises:
a relatively inert gaseous material.

17. A method according to claim 16, wherein the cover gas comprises one or anhydrous nitrogen and carbon dioxide.

18. A cathode, comprising:
a titanium substrate; and
a layer of carbon material disposed on said titanium substrate.

19. A cathode according to claim 18, wherein the substrate comprises a portion of a casing for a wet electrolytic tantalum capacitor.

20. A cathode according to claim 18, wherein the layer of carbon is coupled to the substrate via a one of: a manual painting process, an ink jet printing process, a thermal transfer printing process, a hot stamping process, a dye sublimation process, a screen printing process, a chemical vapor deposition process, a sputtering process.

21. A cathode according to claim 20, wherein the ink jet printing process comprises a thermal ink jet printing process.

22. A cathode according to claim 20, wherein the ink jet printing process comprises a piezoelectric ink jet printing process.

23. A cathode according to claim 20, wherein the chemical vapor deposition process comprises a plasma-enhanced chemical vapor deposition process.

24. A cathode according to claim 18, wherein the carbon material comprises a carbon nanotube material.

25. A cathode according to claim 24, wherein the carbon nanotube material comprises a single-walled nanotube material.

26. A cathode according to claim 18, wherein the titanium substrate comprises an interior portion of a capacitor housing.

27. A cathode according to claim 18, wherein the titanium substrate comprises a thin sheet of titanium.

28. A cathode according to claim 27, wherein the carbon material is disposed on opposing major surfaces of the thin sheet of titanium.

29. A cathode according to claim 27, further comprising:
substantially linear relatively thin grooves disposed on the surface of the titanium.

30. A cathode according to claim 18, further comprising a dielectric separator material covering the cathode.

31. A cathode according to claim 30, wherein the dielectric separator material comprises at least two discrete layers of dielectric separator material.

32. A cathode according to claim 30, wherein the dielectric separator material comprises one of a polyurethane material or a polypropylene material.